

Claim 1 (currently amended): A process with operating conditions for preparing 1,1,1,3-tetrachloropropane, where the production efficiency of the desired product is improved comprising the steps of,

- a) mixing and heating carbon tetrachloride with ~~an olefin~~ ethene in a reactor in the presence of metallic iron, dissolved iron species, and ~~an organophosphate~~ trialkylphosphate co-catalyst to produce a continuous flow of reactor effluent containing ~~a haloalkane~~ 1,1,1,3-tetrachloropropane product,
- b) treating the reactor effluent from step a) ~~with a solid-liquid separation device~~ in a sedimentation tube that separates coarse solid iron particles from the liquid and returns the coarse solid iron particles to the reactor, to produce by this separation a reactor effluent containing a decreased concentration of coarse solid iron particles,
- c) distilling the reactor effluent from step b) in a ~~catalyst recovery unit~~ refluxed evaporator to produce a continuous flow of overhead product containing an increased concentration of ~~product haloalkanes~~ 1,1,1,3-tetrachloropropane and a continuous flow of bottom product containing increased concentrations of dissolved iron and phosphorus-containing species that are active in the catalysis of the reaction to make ~~product haloalkane~~, and 1,1,1,3-tetrachloropropane,

- d) recycling a portion of the bottom product from step c) to the reactor while purging the rest from the ~~system~~ system,
- e) the overhead fraction of the refluxed evaporator being distilled to recover unconverted carbon tetrachloride and unconverted ethene,
- f) a portion of carbon tetrachloride and ethene being recycled back to the reactor, and
- g) the overhead fraction of the refluxed evaporator being distilled to recover purified 1,1,1,3-tetrachloropropane.

Claims 2- 22 (canceled).

Claim 23 (new): The process in claim 1, where reactor temperature is between 80°C and 140°C.

Claim 24 (new): The process in claim 23, where reactor temperature is between 90°C and 125°C.

Claim 25 (new): The process of claim 1, where reactor pressure is between 10 and 300 pounds per square inch.

Claim 26 (new): The process of claim 25, where reactor pressure is between 40 and 200 pounds per square inch.

Claim 27 (new): The process in claim 1, where the molar feed ratio, including recycle streams, of carbon tetrachloride and ethene is between 1.0 and 3.0.

Claim 28 (new). The process in claim 27, where the molar feed ratio, including recycle streams, of carbon tetrachloride and ethene is between 1.1 and 2.0.

Claim 29 (new): The process in claim 1, where the molar feed ratio of tributylphosphate and metallic iron is between 1.0 and 2.0.

Claim 30 (new): The process in claim 29, where the molar feed ratio of tributylphosphate and metallic iron is between 1.01 and 1.3.

Claim 31 (new): The process in claim 1, where the molar feed ratio of dissolved iron and ethene is between 0.01 and 0.10.

Claim 32 (new): The process in claim 31, where the molar feed ratio of dissolved iron and ethene is between 0.002 and 0.008.

Claim 33 (new): The process in claim 1, where the bottom temperature of the refluxed evaporator is between 70°C and 115°C.

Claim 34 (new): The process in claim 33, where the bottom temperature of the refluxed evaporator is between most preferably between 80°C and 115°C.

Claim 35 (new): The process in claim 1, where the refluxed evaporator pressure is between 40 TORR and 225 TORR.

Claim 36 (new): The process of claim 1, wherein the trialkylphosphate co-catalyst is tributylphosphate or tripropylphosphate or triisobutylphosphate.

Claim 37 (new): The process in claim 1, where the bottom fraction from the refluxed evaporator is fed into a second refluxed evaporator

- a. a substantial portion of the 1,1,1,3-tetrachloropropane remaining in bottom stream from the first refluxed evaporator is recovered in the overhead stream of the second refluxed evaporator and
- b. a portion of the bottoms from the second refluxed evaporator are recycled to the reactor.

Basis for Claim Amendment

Basis for amendment to claim 1 wherein steps e, f, g were added is to be found in original claim 6. Claim 1 incorporates subject matter of claim 6.

Basis for the numeric amounts of claims 1 and 23-36 is to be found on page 6 of the specification.

Basis for claim 37 is to be found on page 8, first full paragraph of the disclosure.

No new matter is to be found in the amendments to the claims.

Rejection under 35 USC § 102

Claims 1-3, 5-8 and 10 stand rejected under 35 USC § 102 as being anticipated by *Wilson et al.*

Independent claim 1 has been amended to recite that the recovered product is 1,1,1,3-tetrachloropropane, while the product recovered by *Wilson* is 1,1,1,3,3-pentachloropropane. These are entirely different products and accordingly the rejection under 35 USC § 102(b) for lack of novelty is no longer apropos. Note particularly that at column 3 lines 65, etc., the *Wilson* patent specifies that in the reaction takes place only in the presence of vinyl chloride. The claims as amended recite ethene, a compound chemically distinct from vinyl chloride. Further the claims as further amended have process limitations not found in *Wilson et al.* In view of applicants' amendment to claim 1, it is requested that the rejection over *Wilson* be withdrawn.

Since new claims 23-37 depend from claim 1 and further limit claim 1 the rejection over *Wilson et al* would not appertain.

Rejection under 35 USC § 103

The examiner is correct in his presumption; the subject matter of the various claims was commonly owned.

Claims 1, 4, 6, 9 and 11-22 stand rejected over *Wilson et al* in view of *Woodard* (EP 0 131 561). That *Woodard* reacts carbon tetrachloride and ethene in the presence of iron catalyst and a trialkylphosphate to produce 1,1,1,3-tetrachloropropane was acknowledged by applicants on pages 1 and 2 of the instant application. Applicants also recognized that *Woodard* did not disclose how a continuous system could be designed and it was an object of applicants invention to fashion such a method. The claims have now been amended to emphasize the unique steps of applicants process and these steps are not shown by *Woodard*. The deficiency of the *Woodard* reference cannot be made up by relying of *Wilson et al* because *Wilson et al* does not show the unique process conditions of the instant claims. A further reason that *Woodard* cannot be combined with *Wilson et al* is because *Woodard* is preparing 1,1,1,3-tetrachloropropane and *Wilson et al* are preparing 1,1,1,3,3-pentachloropropane. Since each reference is preparing a different compound, the references are not properly combinable. In view of the amendment to the claims and arguments as set forth above, the rejection is no longer applicable and the rejection combining *Wilson et al* with *Woodard* should be withdrawn.

Docket No. 03179-PA  
Inventors: Wilson et al

Summary

All rejections have been satisfactorily addressed and this application would now appear to be in condition for allowance.

Sincerely,

October 25, 2004  
Date

Sam Rosen  
Sam Rosen  
Reg. No. 37,991

SR/jjr (10/25/04)

<p style="text-align: center;"><b>CERTIFICATE OF TRANSMISSION</b></p> <p>I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail in an envelope addressed to: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.</p> <p>Date: October 26, 2004</p> <p>Express Mail Label No.: EP 464262773 US</p> <p>By: <u>Judy Robertson</u></p>
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